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SCIENCE NEWS LETTER

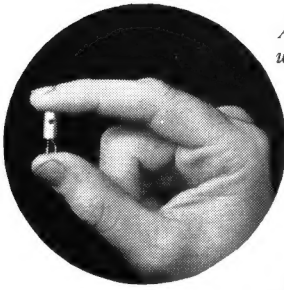
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Spring Azalea

See Page 216

A SCIENCE SERVICE PUBLICATION



*A **Transistor** of point-contact type. Two hair-thin wires control current flow in germanium metal.*

It's helping to win the Battle of the Watts



*Laboratories engineer examines **Transistor** oscillator. It is used in Englewood, New Jersey, where 10,000 subscribers can personally dial distant cities. **Transistors** generate the signals which carry the dialed numbers to other towns and cities. Other uses are in prospect.*

When you keep down the power needed to send voices by telephone you keep down the special equipment needed to supply that power. A great new power saver for telephony is the **Transistor**, invented at Bell Telephone Laboratories, and now entering telephone service for the first time.

Tiny, simple and rugged, the **Transistor** can do many of the things the vacuum tube can do, but it is not a vacuum tube. It works on an entirely new principle and uses much less power than even the smallest tubes. This will mean smaller and cheaper power equipment, and the use of **Transistors** at many points in the telephone system where other equipment has not been able to do the job as economically.

It's another example of how Bell Telephone Laboratories makes basic discoveries, then applies them to improve telephone service while helping to keep its cost down.

TRANSISTOR FACTS

Created by Bell scientists. First announced in 1948.

Has no glass bulb, requires no filament current or warm-up period. Operates instantly when called upon. Uses no energy when idle.



BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in scientific and technical fields.

MEDICINE

Polio Vaccine Effective

Tests of three-way polio vaccine on 161 persons give "encouraging" results. Its production will be delayed until safety trials have been completed.

➤ A VACCINE effective against all three types of poliomyelitis has come through trials on 161 persons with "encouraging" results.

The vaccine brought the anti-polio substances in the blood to as high a level as that induced by an attack of paralytic polio. In some cases a higher protective level was reached.

The vaccine took effect within six weeks. The anti-polio substances, or antibodies, have remained at the high level for four and a half months. This is the longest period studied but presumably the protection will last even longer.

These results are announced by Dr. Jonas E. Salk of the University of Pittsburgh School of Medicine in the *Journal of the American Medical Association* (March 28).

The results should not, Dr. Salk states, be taken to mean that a practical vaccine is now at hand.

(The National Foundation for Infantile Paralysis in New York, which aided Dr. Salk's studies, says no plans have been made yet for field trials of the vaccine.)

The chief reason for the delay in practical vaccine production is the safety factor.

No signs of illness that could be attributed to the vaccine have occurred in any of the persons who got it. A few had some redness and swelling for 24 to 48 hours at the site of the vaccination.

But great care and "considerable time" are needed to prepare and study each new batch of vaccine before it can be given to humans, Dr. Salk points out. This is what limits the speed with which the vaccine can be made practical. Every effort is being made to push the work ahead and overcome this limiting factor.

Next step, Dr. Salk indicated in his report, is to establish precisely the limits within which the effects he reports can be reproduced with certainty. This means not only safety limits but those insuring effective protection in every vaccine batch prepared.

Dr. Salk tried several vaccines. They were made from polio virus grown on monkey kidney and testicular tissues. The kidney tissue gave the best growth of virus with potent antibody raising, or protective, effect.

The virus was treated with formaldehyde to destroy its infectiousness. Injections of it into monkey brains were among the tests for safety through this treatment. For one of the vaccines tried, the treated virus was given in water injected underneath the skin.

Another vaccine was made from formaldehyde treated virus incorporated in a water-in-oil emulsion and was injected into the muscles. This preparation apparently gives better results. The oil emulsion, as has been found in influenza vaccine production, increases the anti-body, or protective, response.

The tests of the vaccine were made on patients at the D. T. Watson Home for Crippled Children, Leetsdale, Pa., and at the Polk State School, Polk, Pa. Some of those given the vaccines were patients who had been paralyzed by polio in recent years. They had, as a result, immunity to the virus type which paralyzed them but not to other types.

Collaborating with Dr. Salk in the studies were: Maj. Byron L. Bennett, U.S.A. (ret.), Dr. L. James Lewis, Miss Elsie N. Ward and Dr. J. S. Youngner, all of the University of Pittsburgh School of Medicine.

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• RADIO

Saturday, April 11, 1953, 3:15-3:30 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS Station.

Archie M. Palmer, chairman of the United States Government Patents Board, discusses "Uncle Sam's Patents."

HEMATOLOGY

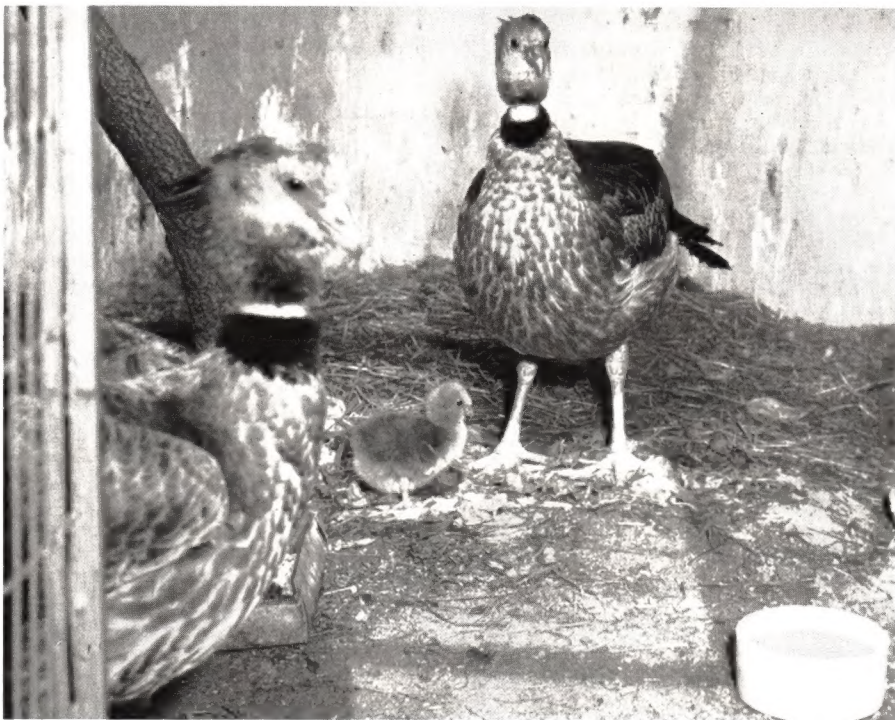
Old as Your Blood Vessels Finds Proof

➤ THE SAYING, "you're only as old as your blood vessels," gets some confirmation from Dr. Daniel J. Perry of the University of California at Los Angeles School of Medicine and Dr. Irwin Linden of the West Los Angeles Veterans Hospital.

Their studies show that after the age of 20, small blood vessels in the normal human body become increasingly fragile. Over 80% of normal people past the age of 60 that were studied had extremely fragile capillaries.

The study involved use of the Rumpel-Leede's test, in which a blood pressure cuff is applied to the upper arm for a given period of time. Fragility of the small blood vessels is determined by the number of capillaries in the arm that then rupture.

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BABY "SCREAMER"—Well protected by its large crested screamer parents, this baby chick was only a week old when its picture was taken. The full-grown bird is as big as a chicken with long neck and legs, according to Dr. William Mann, director of the National Zoological Park, Washington, where it was hatched.

DERMATOLOGY

Anti-Wart Vaccine

➤ A VACCINE against warts may result from a discovery by Dr. James A. Bivins of the New Jersey Agricultural Station and Rutgers University, New Brunswick, N. J.

Even more important, Dr. Bivins told SCIENCE SERVICE, the findings may lead to better knowledge of tumors including, possibly, cancers.

What Dr. Bivins has done is to make a virus from a wart grow on developing chick embryos. So far as is known, this is the first time this has been done.

Growth of a virus on chick embryos is often a first step to vaccine production.

The virus came from a wart removed from Dr. Bivins' own right hand by Dr. O. J. Sokoloff, dermatologist of New Brunswick. The wart was one of 17 developing on Dr. Bivins' hand during the past two years. Dr. Bivins hesitates to call it "the" wart virus because his virus from the chick embryos has not yet been used to produce warts on another human.

Dr. Bivins is a veterinarian, not a doctor of medicine, so he has not been able to make this test nor to try the chick embryo-grown virus as a vaccine. Dr. Bivins reports his research on the wart virus in *Science* (March 20).

The "dramatic" growth of his wart virus on chick embryos, however, may give scientists an easy and rapid way of studying a virus that causes human tumor growths. Warts are considered one example of benign human tumors and study of them is important because of what it may tell about malignant tumors, or cancer.

A wart vaccine that "dramatically" clears warts on cattle and dogs has been made. The virus used for the cattle wart vaccine, however, although taken from cattle with warts, has never produced warts in non-infected cattle. This contradictory situation has not yet been cleared by scientists studying it.

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PSYCHIATRY

Soviet Psychiatry Progress

➤ SOVIET PSYCHIATRY is in a state of "ferment, movement, some conflict, some confusion and forward progress."

This is the impression of an American psychiatrist, Dr. Joseph Wortis of Brooklyn, N.Y., based on his reading of Soviet psychiatric journals and reports which he receives regularly by mail.

Soviet psychiatrists use a "lot of methods we consider old-fashioned, such as baths, general hygienic measures and long vacations," Dr. Wortis told SCIENCE SERVICE.

On the other hand, prolonged sleep treatment is a Soviet method which he thinks might be more widely tried by American physicians.

Sleep treatment is used by Soviet physicians for medical as well as psychiatric disorders. Ulcers and high blood pressure are among those so treated. Only one American physician, so far as Dr. Wortis knows, is doing anything like this. The American is trying insulin sleep for asthma.

Insulin and electroshock treatment are used by Soviet psychiatrists but many consider electroshock "unduly crude, unpleasant and injurious," he states in the *American Journal of Psychiatry* (March).

Prefrontal lobotomy, operation in fairly wide use in the United States, was forbidden by a Soviet Ministry of Health order in 1950.

Pavlov's work on conditioned and unconditioned reflexes is greatly emphasized and his theories extended.

"Whatever its mistakes and shortcomings, Soviet psychiatry compares favorably with our own and is well worth our serious scientific attention," Dr. Wortis believes.

He thinks it a "shortsighted policy" that the *Journal of the American Medical Association* which abstracts about 250 foreign scientific journals does not abstract a single Russian one.

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AERONAUTICS

CAA Head Cites Problems Facing Jetliner Design

➤ TO PROTECT passengers and crews, some sort of a gadget is "urgently needed" to warn jetliner pilots instantly when an engine fails.

Fred B. Lee, acting Administrator of the Civil Aeronautics Administration, told the Airport Operators Council meeting in Kansas City, Mo., that the pilot might lose several seconds before he spots an engine "blowout" without such a device. In a take-off, those seconds may spell life or death for the jetliner's passengers and crew.

Outlining some of the major problems now facing designers of jet aircraft for commercial airlines, Mr. Lee pointed out that the take-off acceleration of a jet is low. He suggested that afterburners might be used to supplement the jet's low thrust. This means more noise around airports. However, the British have reported that public objections to the noise diminished after the sound of jet take-offs became commonplace.

Other problems Mr. Lee listed were these: Jetliners should be designed to use existing airstrips. It is no longer economically feasible to extend runways to meet the

highspeed landings of new jet aircraft. Some sort of reverse-thrust device should be perfected for the planes.

Since jets operate in the thin atmosphere at 35,000 to 45,000 feet, loss of pressure in the plane could be fatal unless the plane can dive quickly to a lower altitude. Some sort of dive brakes might make rapid descent possible.

Communications need to be improved. Above 35,000 feet, so many VHF stations are received at once that the chatter "sounds like a ladies' bridge club." Ice clouds severely reduce reception on medium frequencies.

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ROCKET DEFENDER—Capable of firing 24 2.75-inch "Mighty Mouse" rockets, the F-86D's rocket launching device is displayed for the first time. A bit from a single rocket can knock out a heavy bomber.

METEOROLOGY

Can Occupy Arctic Area

► "THE OCCUPATION of the Arctic Ocean area as opposed to its mere exploration has at last been accomplished," Lt. Col. Joseph O. Fletcher, discoverer of the floating ice islands of the Arctic, said in Atlantic City, N. J.

He told a meeting of the American Meteorological Society on the first anniversary of the landing on ice island T-3 that the experience gained in Arctic Ocean living by the weather and scientific station on the island has now made it possible for man to live on the ocean rather than to make short dashes over its ice covered surface.

"We have learned the techniques of living in this severe, unforgiving environment," he pointed out. The use of snow as a construction material came to be well known. The technique of melting snow two or three weeks before it would otherwise melt in the Arctic spring by spreading dark material on it was mastered.

Supply by air turned out to be easier than had been expected. Three methods of delivery were used. First, the sturdiest bundles were dropped in "free fall" from the C-54 supply plane. Second, parachutes were used for more tender equipment. Third, the most delicate instruments were brought in by a C-47 which landed on the ice island. It was learned by accident, when a few parachutes failed to open, that the two or more feet of soft snow with a crust on it

provided a perfect cushion. Thus even some instruments could be delivered in "free fall" drops.

The ice island seems to be circling around with the prevailing winds in the Arctic Ocean. Some fear was expressed that it would be caught in the Greenland current and drift down into the Atlantic, but this danger has passed. The island is presumably good for years yet.

"From our experience on T-3," Col. Fletcher said, "the Arctic Ocean area can now be regarded as a land mass. We can come and go as we please."

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TECHNOLOGY

Design Method Yields Miniature Transformers

► A NEW design method worked out by the Army Signal Corps helps engineers design the smallest possible transformer needed to handle a given load in electronic equipment. The method sacrifices low electrical losses in the transformer for a saving in weight.

Details are discussed in a 168-page micro-filmed report "Design and Development of Miniature Hermetically Sealed Power Transformers" available from the Library of Congress.

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PHOTOGRAMMETRY

Engraving on Plastic To Revolutionize Maps

► NEW METHODS of reproducing maps by "engraving" on plastics result in turning them out faster and with less labor, it was reported to the American Congress on Survey and Mapping meeting in Washington.

"Scratching," or line-scribing, is done on an opaque coating or emulsion applied to a semirigid transparent plastic sheeting such as Plexiglass. This is one of the new methods that will be the accepted map-making process within a short time. Such methods will soon replace drafting for the preparation of maps by most government agencies, Dr. William E. Wrather, director of the Geological Survey, predicted.

Using the "engraving" method, map-makers can be trained in a few days, production upped as much as 30% and the quality of the maps improved.

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PUBLIC SAFETY

Bathtub Less Dangerous Than Was Once Thought

► THE BATHTUB is less dangerous than most people think. Falls in it cause relatively few of the 28,000 home accident deaths in this country each year, Metropolitan Life Insurance Company statisticians find.

Almost half the fatal falls in the home were on stairs. A considerable number occurred when the victims were "merely walking about a room or going from one room to another."

A rug, highly polished or wet floors and objects "left carelessly around" were held responsible for many accidents.

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GEOPHYSICS

Trucks on Highways Produce "Earthquakes"

► HEAVY TRUCKS rumbling over English roads set up miniature earthquakes that produce background static in the "ears" of seismic equipment being used in the search for underground oil and water.

Aircraft, heavy machinery, wind, rain and squeaky waterworks pumps also are on the seismic prospector's black list, C.D.V. Wilson, British scientist, reported to the Royal Society in London.

Traffic noises can be picked up as much as two miles away from major highways or communities. A waterworks pump once was "heard" four miles away by the sensitive ears of the seismic equipment.

At night weak sounds can be detected in the country. Some of the noises can be traced to geophysical origin, but their precise nature is unknown.

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MEDICINE

Clues to Leukemia

Spot symptoms that show patients may be in pre-leukemia stage. Limited treatment may have kept some victims alive over two years.

► **CLUES TO** detecting acute leukemia before it develops, when treatment for this malignant disease might be most helpful, have been discovered by Drs. Matthew Block and Leon O. Jacobson of the University of Chicago.

As a result, limited treatment they were able to give patients in a pre-leukemia state may have kept some of them alive up to 30 months.

All patients not treated in the pre-leukemia stage died from a few days to three weeks after the leukemia set in. It was from study of these 12 patients, all adults, that the scientists got a picture of the actual development of leukemia and the clues to detecting the pre-leukemic state.

The clues consist of the following observations: Most of the patients had a variety of allergies ranging from hay fever to drug rashes and swellings. The allergic symptoms were usually not very serious but kept repeating. The patients had anemias not helped by blood transfusions. In some patients increasing numbers of white blood cells appeared before the leukemia; in others, as the leukemia became apparent. Bone marrow gradually became crammed solid with white cells. Leukemic changes in liver and spleen usually took place after the leukemia became obvious.

The ten women and two men were under observation for three to 30 months during what the scientists considered was a pre-leukemia state. Until the disease finally developed, the scientists could not be sure whether it would or not.

The symptoms of these 12 patients were much the same as those seen in mice in which leukemia developed spontaneously or was induced by X-rays or chemicals. Up to a certain stage of development, acute leukemia can be halted or prevented in a large percentage of mice by cortisone or ACTH.

In normal persons responding to toxic agents, the blood-forming organs shrivel and then sometimes temporarily over-renew themselves. Normal cell action checks this renewal, or regeneration, and restores normal balance.

In pre-leukemia the blood and organ response is similar but when the disease progresses into acute leukemia, the regeneration gets out of control. It is only in this state of excessive over-regeneration that leukemia can be accurately diagnosed, the Chicago scientists found. Up to that point the pre-leukemia response is a normal type of response.

The research was announced by the American Cancer Society which supports it.

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EVIDENCE OF CANNIBALISM—
The Aztalan bone section (left) held by George Holcomb of the University of Wisconsin has marks made by diners hacking at it to get at the marrow.

PHYSICS

Supersonic Sled Tests Air Force Parachutes

► A SUPERSONIC sled zipping along gleaming steel rails at 1,500 miles an hour now is being used at Edwards Air Force Base, California, to test the design of new parachutes that some day may save the lives of fast-flying jet pilots.

From a standing start, the rocket-powered sled can reach its peak speed in only 4.5 seconds, but in that time it travels 5,500 feet—more than a mile. At its top speed, the sled is traveling about twice the speed of sound, measured at sea level.

The sled, created by the Cook Research Laboratories for the Air Force, is powered by a North American Aviation rocket engine. Currently the sled is being used to test parachutes and other equipment associated with jet planes. Experts figure if the equipment works satisfactorily on the sled, it should work on jet planes that travel about half as fast as the sled.

The sled is powered for only eight seconds before its \$100 oxygen-alcohol liquid fuel supply gives out. It scoots along 10,000 feet of track similar in type and size to standard railroad rails, but smoother. A scoop dips into a trough of water lying between the rails to stop the sled in about 300 feet.

With adaptations, the sled can be used to reveal the effects of high speeds and fast stops on human beings. Its propulsion system can be used to assist airplane take-offs from runways or carriers.

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MEDICINE

Arthritis From Hormone

► **NEW EVIDENCE** that the growth hormone of the pituitary gland in the head may be the cause of arthritis has been discovered by Drs. C. H. Li and William O. Reinhardt of the University of California.

Their study started out as an investigation of cancer, supported by the American Cancer Society and the Lasker Foundation. When the rats they were using developed arthritis, the cancer study was sidetracked.

The scientists found that pure growth hormone would produce arthritic conditions occasionally in normal rats and in all rats with adrenal glands and ovaries removed. The joint swellings, tenderness and other arthritic symptoms were relieved when hydrocortisone was given.

The experiments, reported in *Science* (March 20), give preliminary experimental confirmation of a theory suggested by a number of scientists, including Canadian Dr. Hans Selye. According to this theory, the pituitary keeps on producing growth hormone at a significant rate even after the

body has grown to maturity and no longer needs the hormone for growth.

In most cases this is not damaging in early adulthood, the scientists say, because the cortisone produced by the adrenal glands combats the action of growth hormone. But as people grow older, the adrenals produce less cortisone.

Then the growth hormone has no place to go. It cannot go into normal body growth because normal growth is completed. And there is not enough cortisone to combat it. So the growth hormone starts making the joints grow—hence arthritis.

Then when cortisone is injected into the arthritis sufferer, the action of the growth hormone is once again checked and the patient gets better.

Drs. Li and Reinhardt do not contend that their evidence gets this theory out of the woods yet. But on the basis of the new experiments, and earlier ones in many laboratories, it looks pretty good.

METEOROLOGY

Weather Maps of Future

➤ TWO STARTLING developments in routine daily weather forecasting are being promised by weathermen for from three to ten years from now.

First, all the past history of the weather, so carefully collected by the world's weather bureaus, can be discarded for this purpose.

Second, the laborious drawing of large-scale weather maps by hand in regional and local weather forecasting stations all over the United States will no longer be necessary.

This happens when electronic "brains" take over the job of predicting the weather. Already the Air Weather Service, the Navy and the U. S. Weather Bureau are working on plans to put the electronic computers and the method of numerical forecasting into operation.

One small setback came when the Budget Bureau under ex-President Truman turned down a request by the Weather Bureau for funds for an electronic computer. It is not expected that the Eisenhower administration will put the computer back in the budget, but it is believed that the computing work can be handled by the more well-heeled military services.

Numerical forecasting will represent a sharp break with the belief that to forecast tomorrow's weather a forecaster has to know his weather history. (See SNL, March 28, p. 198.)

The computer will provide master maps for the United States, a map showing today's weather and another showing its prediction of tomorrow's. The local forecaster will then use these along with local influences known to him to determine what the weather will be in any one spot.

Work is being done in numerical forecasting at the Institute for Advanced Study, Princeton, the Cambridge Air Force Research Center, Mass., the University of Stockholm, the U. S. Weather Bureau and the University of Chicago.

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METALLURGY

New Alloy Saves Scarce Beryllium

➤ A NEW metal alloy of copper, nickel, silicon and aluminum has been found that promises to do the job of a strategic copper-beryllium alloy in accounting and billing machines, aircraft instruments and electrical instruments, the American Society for Metals meeting in Los Angeles was told.

The copper-base alloy has good qualities of electrical conductivity, corrosion resistance and springiness. Developed at Battelle Memorial Institute, Columbus, Ohio, for the International Business Machines Corporation, the metal also promises to be

"somewhat less" expensive than its copper-beryllium forerunner.

Although the copper-beryllium alloy is a little better, beryllium is critical because of its possible large-scale use in the atomic energy program. It also is expensive, selling for about \$71 a pound, as contrasted to the less-than-a-dollar selling price per pound for each of the new alloying elements.

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PUBLIC HEALTH

Uranium Cure Claims Combated by Food, Drug

➤ URANIUM IS such a glittering word in this atomic age that thousands of ailing persons were led to pay admission fees to abandoned uranium mines in Montana in the vain hope of being cured of arthritis and related conditions.

When the promoters of this started shipping radioactive ore and treatment devices in interstate commerce, the Food and Drug Administration stepped in and seized the shipments.

The ore, selling for \$10 per five-pound sack, gave off fewer gamma rays than the luminous dial of an ordinary wrist watch, FDA tests with Geiger counters showed. The treatment cabinets, valued by the shippers at about \$400 each, also emitted very weak radioactivity.

The Government's charges were based entirely on false and misleading claims. The radioactivity was too low to constitute a health hazard.

Any product emitting enough radioactivity to affect the functions of the body is dangerous to use without medical supervision, FDA warns, and must be labeled:

"Caution: Federal Law Prohibits Dispensing Without Prescription."

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SURGERY

New Operation Stops Breast Cancer Spread

➤ MORE WOMEN will be saved from breast cancer death if a new type of operation lives up to present promise.

The operation was devised by Dr. Jerome U. Urban of Memorial Center for Cancer and Allied Diseases, New York. It is based on the fact that there are two main pathways by which cancer cells spread from the breast to other parts of the body.

One, the primary route, leads to armpit tissues. Conventional breast cancer operations include removal of these.

The second leads to tissues under the ribs, next to the breast-bone. Dr. Urban's operation removes this pathway also.

Of 90 patients operated on by the new method during the past 27 months, 41% were found to have had cancer cells spread to the previously unremoved tissues. Final evaluation of the effect on cure rates cannot be made until five years are up.

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ROLLIGON TIRES—These watermelon-shaped tires have an extremely low air pressure of only one and one-half to five pounds per square inch. They allow a Navy jeep to run over the inventor, William Albee, Carmel, Calif. Greater maneuverability of military and farm vehicles over sandy beaches and swampy land is claimed for them.

PSYCHOLOGY

Anxieties Hinder Accomplishments

► **SETTING YOUR** goals too high, sometimes called "hitching your wagon to a star" or "shooting at the moon," may cause anxieties that hinder normal accomplishments, state Dr. Joseph Sheehan and Seymour Zellin of the University of California at Los Angeles psychology department.

Employing a special pinball machine devised by Dr. Julian Rotter of Ohio State University, each subject was asked to predict his score before each of 21 five-shot series. The machine was rigged so that performance depended largely on chance. Psychological scoring of subjects was based upon discrepancies between estimated and actual performance scores.

These were some of the results:

1. In many cases high goals were followed by poor performances, and better performances frequently followed more cautious predictions.

2. High psychological scores generally indicated over-confidence and putting pressure on one's self, while low ones suggested inferiority feelings.

3. In general, American students tended to overrate their abilities, while foreign students were more cautious in their estimates.

4. Stutterers were found to resemble physically handicapped persons in having lower than normal psychological scores.

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DENTISTRY

Gland Chemicals Make Teeth Erupt and Grow

► **TWO GLAND** chemicals are responsible for tooth growth and eruption. This discovery apparently answers for the first time the question of what makes teeth erupt and grow.

It was announced by Drs. Louis J. Baume, Herbert M. Evans and Hermann Becks of the University of California at the meeting of the International Association for Dental Research in Philadelphia.

The gland chemicals are the growth hormone from the pituitary gland in the head and thyroxin from the thyroid gland in the neck. Growth hormone makes teeth grow but thyroxin is needed to make them erupt.

One 18-year-old youth has already benefited from the discovery. He was seen in the California dental clinic because he still had his baby teeth. A mild and previously undetected thyroid deficiency was found. Thyroid hormone treatment caused his permanent teeth to erupt.

In their animal experiments, the scientists found that the best combination for the development of the teeth was a combination of growth and thyroid hormones. At present growth hormone is not used in man.

The experiments were done in rats without pituitary glands or thyroids. In a group of dwarf rats, which had been deprived of their pituitaries and hence of growth hormone for most of their lives, the scientists showed the remarkable power of the two hormones.

The little tooth growth which had occurred in these animals was folded and malformed. Growth and thyroid hormones made the teeth grow to normal size and almost completely repaired the malformation.

The scientists said the thyroid hormone makes the embryonic tooth buds develop, and later puts enamel on. Growth hormone is responsible for growth of pulp, bone, dentine and other tooth structures.

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HORTICULTURE

Azaleas Now Bloom In Southern States

See Front Cover

► **SURE PROOF** that winter has fought a losing battle and that spring is really here, the azaleas have burst into flower throughout the southern states. As the spring sun climbs higher in the sky, new areas farther north will see these handsome flowering shrubs come into bloom.

The most popular azalea varieties in the United States come from Asiatic stock. These oriental varieties have a wide range of bright colors—white, purple, red, orange, yellow and many shades of pink.

The Omurasaki azalea blossom, pictured on the cover of this week's SCIENCE NEWS LETTER, is a deep lavender, almost purple. This variety, with its large flowers, is one of the Japanese types that have flourished in the warm climate of the East Coast.

Because azaleas occur in so many different varieties with blossoms that no catalogue can possibly describe adequately, prospective buyers should visit their nurserymen in the spring, when the plants are in bloom, to choose azaleas for their gardens.

Science News Letter, April 4, 1953

VETERINARY MEDICINE

Cows Now Younger Than Their Teeth Tell

► **HERE IS** one female who can knock two years off her age without lying about it: Bossie, the cow.

The "dental timetable" often published and generally accepted for determining a cow's age may have been correct many years ago, for slow developing breeds, but it is "misleading" now, declares the American Veterinary Medical Association in Chicago.

A cow with a full mouth of incisor teeth, states the association, is more likely to be just over three years old rather than five as the old schedule would have it.

Science News Letter, April 4, 1953

IN SCIENCE

TECHNOLOGY

White Stripe for Roads Can Be Made of Plastic

► **LONG-WEARING**, heat-resisting plastic stripes soon may mark traffic lanes and parking spots on the nation's roads and streets if the findings of the Texas A. & M. Engineering Experiment Station, College Station, are adopted.

The plastic stripe, either white or yellow in color, works on both asphaltic and concrete pavements. Made of a resinous binder, pigments, fillers and sand, the plastic material is applied in melted form from an oil bath kettle heated to 276 degrees Fahrenheit. The stripe "sets" in less than five minutes, and should last from three to five years on roads of relatively light traffic.

Science News Letter, April 4, 1953

PSYCHOLOGY

Silence Worse Than Scolding

► **SOME PARENTS** make a great virtue of the fact that they never shout at their children or spank them when they misbehave. Instead, they give the naughty child the silent treatment, refusing to talk to him for a while.

Such treatment is actually a form of intimidation, a report from the National Hospital for Speech Disorders points out. It can be much more harmful, especially to a sensitive child, than a spanking.

What many parents seem to forget is that the object of discipline is not to punish the child but to prepare him for becoming an adult, to guide him so that in later years he will avoid the mistakes that might hinder a healthy, happy adjustment to life. The hospital's report points out further that, if discipline is necessary, one of the best ways of administering it is to withdraw some privilege from the child for a stated period.

"In this way he learns, without being unduly intimidated, that life is a matter of give and take—that to enjoy its good things he has to conform to certain rules of acceptable behavior. One unusually effective means of discipline is available in homes with television sets, a recent survey of school children having shown that 20% prefer a spanking to losing television privileges, and that 21% would sacrifice their allowance rather than the right to watch their favorite television programs.

"Whatever privilege is withdrawn from the child, parents should administer the discipline with sympathy and understanding, being careful to let the child know that they are rejecting his behavior and not him."

Science News Letter, April 4, 1953

THE FIELDS

CYTOLOGY

Research Points Way to Interchange of Organs

► **TISSUE "SPECIFICITY,"** the factor that has heretofore prevented interchange of tissues and organs between human beings, is an acquired factor, say a team of doctors of the University of California at Los Angeles School of Medicine.

Cross-grafting of skin, or replacing of diseased organs with healthy ones, may be possible at some future date. It cannot be done successfully at present.

The doctors' research has demonstrated that permanently successful "takes" of cross-grafted skin are possible in chicks less than four days old. But as the chicks grow older successful "takes" are no longer possible.

This indicates that the process by which tissue becomes specific to an individual and "dies" when transplanted to another may be due to certain changes that are gradually acquired by the tissue as the individual matures.

If the nature of the process can be determined, it may be possible to reverse it temporarily. This would open the way to the establishment of "banks" where healthy skin and organs could be preserved by special culture methods for future emergencies.

The research was performed by Drs. William P. Longmire, Jack Canon, Willard S. Smith and Robert Weber.

Science News Letter, April 4, 1953

AERONAUTICS

Urge Crash Protection For Private Airplanes

► **AIRCRAFT MANUFACTURERS** have been urged to make future business and personal type airplanes adaptable to the use of shoulder harnesses.

In a resolution aimed at the manufacturers, a Cornell University Committee for Transportation Safety Research also recommended that cabins of light airplanes be constructed so they would not collapse during a crash at minimum flying speeds.

The resolution, which does not apply to commercial transport planes, was based upon research conducted by the Air Force, Navy and Civil Aeronautics Administration.

A report on crash injuries issued late in 1952 by the Cornell University Medical College revealed that shoulder harnesses effectively reduce probability of dangerous head injury in severe accidents, provided the cockpit or cabin remains substantially intact during the crash.

The report also pointed out that many civilian pilots do not use shoulder harnesses when they are available. One series

of planes studied revealed that the shoulder harness had been removed in two out of three planes.

The possible reasons listed for this were: insufficient understanding of the value of shoulder harnesses, a willingness of the pilot to take chances, discomfort or inconvenience of the harness originally installed in the planes, or to keep the harness straps from "flopping around" in the cockpit.

An illustration in the report pictured a crashed plane, the front half of which was a tangled mess of steel. The picture caption said: "Severe accident. No shoulder harness available. Pilot sustained dangerous head injuries which resulted in death."

Science News Letter, April 4, 1953

HEMATOLOGY

More Plasma Possible When Red Cells Returned

► **PROVIDED YOU** maintain a diet high in proteins and calories, you may be able to give plasma without ill effects much more frequently and in greater amounts than current practices permit.

This is the opinion of a group of doctors at the University of California at Los Angeles and the West Los Angeles Veterans Administration who have developed new blood separation techniques.

The technique consists of taking blood from the donor, separating red blood corpuscles from the plasma and returning the vital red cells to the subject, using a single bottle that is not opened during the procedure.

Small, carefully selected groups of donors capable of providing large amounts of plasma would perhaps be a better source of the substance than current stockpiles, which are taken from large masses, the doctors say.

This method would also reduce the chances of transmission of such diseases as viral hepatitis, frequently a problem in present methods.

Doctors performing the research were Drs. John S. Lawrence, William S. Adams, S. H. Bassett, W. H. Blahd and W. G. Figueroa.

Science News Letter, April 4, 1953

MEDICINE

Keep Ulcer Type Out of Worry Jobs

► **BEFORE A** man is promoted to a job with worries that may "explode in peptic ulceration," his doctor and the plant doctor should have a conference to learn whether he has had ulcers or is the type who may get them.

This suggestion for protecting the patient from a "quasi-occupational" disease was given the American Academy of General Practice meeting in St. Louis by Dr. C. D. Selby of the University of Michigan Medical School at Ann Arbor.

Science News Letter, April 4, 1953

GEOPHYSICS

Bounce Radio Waves From Trails of Meteors

► **LONG DISTANCE** radio signals can be bounced off the ionized trails left by tiny meteors high in the atmosphere.

Discovery of this radio-wave-reflecting layer may double or triple the channels available for radio communications over thousand-mile distances, Dr. O. G. Villard, Jr., of Stanford University, California, reported to the Institute of Radio Engineers meeting in New York.

The ionosphere, a radio-reflecting "roof" composed of layers of ionized air in the upper atmosphere, is now used to get radio signals beyond the horizon. If it were not for this "roof," the radio waves, which travel in straight lines, would escape into outer space.

Radio links now require two or three channel assignments instead of one because the ability of the layers to reflect signals at any given time depends upon the sun's position, so frequent shifts are necessary for continuous communication.

Using frequencies of 10 to 25 megacycles, relatively low power of only 1,000 watts and simple antennas, hand-keyed telegraphic signals have been sent up to 1,000 miles by reflection from the so-called meteor layers at times when regular ionospheric layers were not able to reflect at all.

Dr. Villard's explanation is that the thousands of tiny meteors ionize the earth's outer air when they smash into it. Although these tiny dust particles from outer space are mostly far too small to be seen with the naked eye, their total effect is sufficient to bounce back a weak signal.

Meteor echoes last longer at lower frequencies, in the vicinity of 15 megacycles, Dr. Villard reported, than at the higher frequencies.

Science News Letter, April 4, 1953

MAMMALOGY

Male Shrew Finds Female Justifies Name

► **PITY THE** poor shrew—the male shrew, that is.

For experiments show that the female shrew squeaks shrewishly at the male when he crosses her and otherwise browbeats him till he scampers away in a fright.

The hen-pecked shrew, however, takes it out on smaller males, scaring them off with similar tactics, reports Dr. Robert L. Rudd of the Museum of Vertebrate Zoology, Berkeley, Calif., in the *Journal of Mammalogy* (Feb.).

About the only shrews that manage to get along together, Dr. Rudd said, are immature specimens. Several of them, two months old at capture, lived amicably together for six weeks.

But this happy unity ended abruptly when food ran out—the two weakest were killed and eaten by the others.

Science News Letter, April 4, 1953

HORTICULTURE

Research Yields New Lilies

Many years of research are responsible for your florist's stock of superior Easter lilies. Creation of new flower varieties is the result of vision, patience and hard work.

By HORACE LOFTIN

► NOTHING IN the world is easier for you to get than a big bunch of Easter lilies—if you have the money.

Your florist has them in many varieties, big and small, fragile and hardy. Gorgeously blossoming "Easter" lilies can be obtained 12 months a year.

But how these varieties are developed, how they must be nursed and pampered to grow at all, how they must be coaxed into blooming and seduced into fruiting, is a tale of patience, planning and hard work. Money will not bring a new disease-resistant or early-blooming variety into existence. Only many trials, many errors, and a few successes in the greenhouse and laboratory can do this.

The center of lily breeding research in the United States, and perhaps the world, is a small cluster of greenhouses at the U. S. Department of Agriculture's experimental station at Beltsville, Md. The guiding spirit within the bustling greenhouses is Dr. Samuel L. Emsweller, an amiable, enthusiastic botanist who has been with the Agriculture Department since 1935.

The tiny sprouting seeds and bulbs and the tall, flowering lilies that fill the greenhouses represent the varieties you will buy in the not-distant future. Many of them are still in the experimental stage. Others have been perfected; these are being raised in mass, to produce enough for distribution to commercial lily growers.

Many Species Incompatible

What is involved in the creation of new or improved varieties of lilies?

The basic step in making a new variety is to cross two different species or varieties—then step back to see what happens. And on the first step is found the first difficulty.

One of the biggest headaches of lily breeders is the high incidence of self-incompatibility within a species and cross-incompatibilities between species.

This means that a great number of varieties can only reproduce asexually, without meeting of egg and sperm, simply throwing off new shoots from parts of the bulb, or scales. But success in creating new varieties hinges on the botanist's ability to cross two different plants, each of which show characteristics desirable in a new variety.

If he cannot fertilize the egg of one of them with the sperm of the other, he is stopped cold.

Dr. Emsweller and his co-workers have attacked this problem by using a chemical growth regulator, which increases the percentage of successful fertilizations in many cases. Breaking a petal connection near the pistil of a lily and applying a weak solution of the regulator, naphthalene acetamide, to the wound, Dr. Emsweller has been able to pollinate successfully several usually uncooperative lilies.

In experiments with four Easter lily varieties, he was able to obtain fruit and seed of three of them only when he used the growth regulator. In the fourth variety, 48 untreated plants yielded nine fruits with 207 fertile seeds; while 90 treated plants gave 90 fruits with 2,414 good seeds.

Perhaps the most dramatic work in lily breeding at Beltsville is experimentation with a chemical that doubles the normal number of hereditary units of a plant, usually resulting in a plant markedly different and often superior to the parent

lilies. This chemical is "colchicine," derived from the plant meadow saffron, *Colchicum autumnale*.

The inheritable characteristics of a living being are determined by genes, highly complex chemicals that control the future development of the organism. These genes are grouped in distinctive bands called chromosomes in the nucleus of a living cell. With the lilies, there are 12 different chromosomes in the cell, and there are two of each kind, making a total of 24 chromosomes in every lily cell—normally.

But when colchicine is applied to the tip of a flowering stem, or better, to a bulb scale, it often happens that the number of chromosomes becomes twice as great, producing 48 chromosomes in each cell, four of each kind of chromosome.

Actually it often happens that varying numbers like 47, 46, 45 or even 49 chromosomes result from colchicine treatment; but in general the number of chromosomes can be said to double.

What are the advantages of doubling the number of chromosomes?

Dr. Emsweller has found that tetraploid lilies (those with four sets of chromosomes;



EASTER LILIES—Research in the United States has led to freedom from foreign sources of lily bulbs. The blossoming plants are now available 12 months of the year at florists. Use of the chemical, colchicine, can double the number of hereditary units, yielding sturdier plants with larger flowers.

normal lilies are "diploid," with two sets) usually yield flowers and plants with better "substance." This means tetraploid lilies are not as easy to bruise, or hard to store or ship, as the normal diploids. The advantage of lilies of better substance to commercial nurserymen, obviously, is tremendous.

Tetraploid plants often are taller and sturdier than regular lily plants, Dr. Emsweller has found, and the flowers are often twice the size of diploids. This difference in flower size is truly spectacular, and is of immediate importance to the nurseryman.

And, Dr. Emsweller has found, tetraploid lilies often produce a higher percentage of fertile seeds than lilies with just two sets of the 12 kinds of chromosomes. Several types of tetraploid Easter lilies have been developed at Beltsville, and are being propagated there for early distribution to commercial nurserymen.

Aim at Virus-Free Strains

Successful production of seeds is all-important in breeding new varieties, but there is an additional advantage in prompting more lilies to seed. The whole lily group, *Lilium*, has been hard hit by virus diseases that kill the plants or mar their beauty. These diseases, however, are not seed-borne in *Lilium*. So if, instead of propagating new plants from parts of infected parent bulbs, a way is found to produce desired varieties from seeds, then virus-free strains can be developed.

Once a breeder has obtained fertile lily seeds, however, his troubles are far from over. This is not so apparent with the Easter lily in which the seeds germinate within a few weeks. But with many other species, germination does not normally occur from 18 to 20 months after planting.

Even with the patience of a botanist, 20 months added to the approximately 18 it takes to raise many lilies from seedling to flowering plant can seem too long to wait. So, using a speeding-up technique, Dr. Emsweller has been able to cut the time of emergence of seedlings from 18 or 20 months to as little as four months.

To do this he places seeds in a sterilized bed of vermiculite or peat, all contained in small jars. He closes the mouth of the jars with polythene plastic sheeting, which retains moisture while allowing air to en-

ter. The jars are then stored at a constant temperature of 65 to 67 degrees Fahrenheit. In a month or so any seedlings that have produced rootlets or tiny bulbs are removed to a temperature of 32 to 35 degrees Fahrenheit. In two or three months, the seedlings are removed again and placed in flats containing vermiculite, where they grow speedily.

Chromosomes Tell Ancestry

In the breeding of new hybrids and varieties of nearly all plants, breeders often lose track of the history of a new creation. In the case of roses, for instance, it has become impossible to determine the ancestry of any modern variety.

With lilies, happily this may not happen any more. Dr. Emsweller and his colleagues have discovered that the chromosomes of different lily species have characteristic shapes that can be identified under the microscope. A normal lily with two sets of 12 chromosomes got one of the sets from its "mother" and one from its "father." So by examining the structure of chromosomes in a lily, the parents can be ascertained, and the plant re-produced by making that cross again.

Easter lily blooms are available 12 months of the year now, largely due to a schedule of preplanting cold storage worked out by Department of Agriculture scientists. They discovered that lilies could be stored at temperatures just below freezing and still give a high flower production as long as a year after storage. Before this work, it was thought that temperatures below 35 degrees Fahrenheit would harm the lilies.

Species Number 85

The genus of lilies, *Lilium*, contains about 85 species, found naturally, with only five exceptions, in the north temperate zone of North America, Europe and Asia.

In the United States, 85% of the lilies grown are Easter lilies, *Lilium longiflorum*. Other commercially important species are the regal lily, *L. regale*; the gold-band lily, *L. auratum*; the Madonna lily, *L. candidum*; and the beautiful pink-spotted lily, *L. speciosum*.

Before the second World War, nearly all lily bulbs in the United States came from abroad. About 27,000,000 were brought here in 1940 alone. Today this picture has ended, with most lily bulbs used in this country being produced here.

Just as research has been a key to America's first place in the world of machines and engineering, so is it proving to be the way to attain the lead in creating new floral beauty.

Science News Letter, April 4, 1953

An estimated 15,000,000 persons in the United States—3,000,000 of them children—have some degree of *hearing loss*.

Billions of *meteoroids* plunge into the earth's atmosphere every day at speeds as high as 45 miles a second.



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Flowers Greet Easter

► FLOWERS HAVE been associated with Eastertide ever since the earliest days of Christianity. Even in pre-Christian times there was a springtime feast of rejoicing, when people wore wreaths of flowers in their hair, hung garlands of flowers around their pagan altars.

After winter, mankind has apparently always found it fitting to make offering of

the first flowers, just as after harvest we have the impulse to make offering of the first fruits.

Easter floral observances that have become conventional in our own time and land have drifted away from the freshness and naturalness that they had in the younger days of Christianity, and from the naivete that was theirs in the pagan childhood of our culture. The wreaths of flowers in the hair have suffered a sad change into mere simulacra on women's bonnets, costly but artificial.

The flowers piled on the altar or banked around the pulpit are real, to be sure, but almost always exotic, besides being forced to bloom out of their natural time. The one we call Easter lily, for example, would not blossom until July if left to itself outdoors; and it came originally from Japan!

We can really learn more of the Easter symbolism of flowers if we take a turn in the woods or fields during Eastertide, and see our native wildflowers as they grow. Almost all of our spring flowers are either white, like bloodroot and dogwood, or light-tinted, like the lovely pasque flower of the prairies. These are true Easter colors.

Some, like violets, run a gamut of color through a hundred species; or are white in some and tinted in others, like the trout-lilies that are white in the Midwest, yellow in the East and the Rocky Mountain region.

The expectation of "resurrection, and life everlasting" can be seen better exemplified if we look at flowers that have not been violently divorced from their roots. Practically all our early spring flowers are perennials, either springing up from bulbs or rootstocks hidden in the sepulcher-like soil, or bursting forth, even before the leaves appear, on the seeming-dead branches of shrubs and trees.

Science News Letter, April 4, 1953

ACOUSTICS

Study Sound in Fog And in Mountain Air

► WHAT WEATHER conditions do to the sound of sirens, foghorns and whistles is being studied at the University of California at Los Angeles. The effects of various situations ranging from clear but turbulent mountain air to seashore fog are being studied.

Using a toy oxy-acetylene cannon as a sound source, Dr. L. P. Delsasso is trying to determine how much the intensity of sound is decreased as it travels through the two media. This is done by recording the variation in intensity of the sound between two successive microphones.

Studies recently completed in the High Sierra indicate that turbulence tends to scatter the sound waves.

The fog phase of the study is now underway and is currently concerned with the nature of the fog medium. A complex electronic device developed in the research uses a tiny beam of light to determine the size and number of fog droplets in a given area.

Mountain studies have been supported by the Air Force. The fog studies are being sponsored by the Office of Naval Research.

Science News Letter, April 4, 1953

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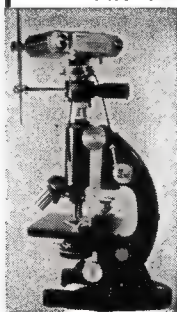
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AERONAUTICS

New Seaplanes Halve Pacific Crossing Time

► THE PACIFIC will be spanned in 1954 by a fleet of flying boats that can whisk passengers, litter patients and cargo across the ocean at nearly twice the speed of present-day seaplanes.

The first flight model of the R3Y-1 Tradewind is scheduled to take to the air late this summer and is to be followed soon by others.

The Tradewind is designed to fly at a top speed of 350 miles an hour, but even when heavily loaded it can cruise at about 300 miles an hour. Equipped with air conditioning, the 80-ton flying boat has rearward-facing passenger seats and also can accommodate litter patients and cargo. Rugged magnesium cargo decks lighten the plane.

Finishing touches are being added to the flight model now being built for the Navy Bureau of Aeronautics by the Consolidated Vultee Aircraft Corporation, San Diego, Calif.

Science News Letter, April 4, 1953

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What General Electric people are saying . . .

I. F. KINNARD

Mr. Kinnard, with GE since 1922, is manager of the Engineering, Meter, and Instrument Department.

" . . . The importance of development engineering to business and industry in general can hardly be overestimated. Successful development engineers are constantly bringing along new products for a new age.

Sometimes developments occur in time-tested and proved products, where they are least expected. Over the past half century G.E. has produced many millions of watthour meters. They have undergone a gradual evolution and refinement so that many considered this a barren field indeed for the development engineer. Yet, as recently as 1948, a completely new watthour meter was developed. It successfully employed for the first time in the engineering world the principle of magnetic suspension of a rotating part. The maintenance-free life of the meter was increased manyfold by this development—a development that was the product of close collaboration of development engineers and materials specialists, particularly metallurgists working on new permanent magnet alloys.

An important part of the development engineer's job is to take that believed to be possible and prove it practical. And in doing this job, he contributes significantly to the evolution of new and better products for a constantly rising standard of living. And whether he realizes it or not, he is one of the vital links in our American economy. His developments are helping to win acceptance throughout the world for the kind of system that brings them forth.

General Electric Review

J. E. BURKE

Dr. Burke is manager of the Metallurgy Section of the Knolls Atomic Power Laboratory

" . . . Nuclear reactors are new, but many of the design problems facing the metallurgist are strictly old-fashioned. Such properties as strength, formability, thermal conductivity, resistance to corrosion at high temperatures, and of

course, cost and availability, are as important in controlling the selection of materials for nuclear reactors as they are in controlling the selection of materials for other applications.

In addition to these properties, however, it is necessary to consider the interaction of the materials with neutrons. Everything enclosed in the heart of the reactor interacts to some extent with the neutrons, and a very careful control of materials that are included in the reactor is thus necessary.

Since vanadium appeared to be a possible material for use in nuclear reactors, a program to investigate its properties was undertaken several years ago. Although nominally pure vanadium had been available for a number of years, it was brittle and could not be fabricated. Some ductile vanadium had been prepared by calcium reduction of the oxide, but only beads and small pellets were produced. In improving this product, additions of iodine were made to the mixture of V_2O_5 and calcium. Upon heating this charge in a closed pressure vessel, the additional heat provided by the combination of iodine and calcium raised the temperature enough so that a large ductile button of vanadium was obtained. Unfortunately, subsequent runs yielded buttons that were brittle. After extensive investigation it was finally found that the brittleness was due to nitride in the oxide, and the final procedure used involved a careful denitriding of the vanadium oxide by heating in moist oxygen for several hours. The product as now produced can be rolled into thin foil, drawn to wire, or given any of the standard metallurgical treatments except hot working. Because it avidly absorbs oxygen to become brittle, it cannot be heated in air.

There are, of course, a vast number of other metallurgical problems encountered. As in other fields, improvements in

materials are imperative if important advances in reactors are to be made. These require continuing work not only directly in the development of better materials but also on the fundamental studies that pave the way for the applied developments.

General Electric Review

C. W. LAPIERRE

Mr. LaPierre is a Company vice president and is general manager of the Aircraft Gas Turbine Division

" . . . In 1952 the Aircraft Gas Turbine Division produced over 90% more engines than it did in 1951. And with this increase in production, the General Electric Company became the world's largest known producer of jet engines.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCES IN CANCER RESEARCH, VOL. 1—Jesse P. Greenstein and Alexander Haddow, Eds.—*Academic Press*, 590 p., illus., \$12.00. The first of an annual series reporting recent discoveries.

ANIMALS UNDER YOUR FEET—Ivah Green—*Laurel Publishers (Grosset & Dunlap)*, 129 p., illus., \$2.75. Contains 17 true-life stories for children.

AUGUSTINE TO GALILEO: The History of Science A.D. 400-1650—A. C. Crombie—*Falcon Press (British Book Centre)* 436 p., illus., \$9.00. Science and scientific thought in the period between the classical and the modern world.

BOB WHITE—R. W. Eschmeyer—*Fisherman*, 50 p., illus., paper 50 cents, cloth \$1.50. The story of a quail.

BUILDING AMERICA'S HEALTH: Vol. 2, America's Health Status, Needs and Resources—President's Commission on the Health Needs of the Nation—*Government Printing Office*, 320 p., paper, \$1.25. The basis for the conclusions and recommendations reported in the first volume.

BUILDING AMERICA'S HEALTH: Vol. 3, America's Health Status, Needs and Resources—A Statistical Appendix—President's Commission on the Health Needs of the Nation—*Government Printing Office*, 299 p., paper, \$1.50. Statistics on health personnel and facilities, and on the utilization of health services.

CELLULOSE: The Chemical That Grows—William Haynes—*Doubleday*, 386 p., illus., \$4.00. From the age of Marco Polo to the present, the history of this source material of rayon, paper, lacquer, plastics, etc., is traced in both fact and legend.

COMPARATIVE CONDITIONED NEUROSES—Edward J. Kempf, et al., Eds.—*New York Academy of Sciences*, Vol. 56. Art. 2, 239 p., illus., paper, \$3.50. Discusses the principles of nervous breakdown, the dynamics of conditioning neuroses, the adjustment patterns in schizophrenic patients, etc.

DEMOCRACY BEGINS IN THE HOME—Ernest Osborne—*Public Affairs Committee*, No. 192, 28 p., illus., paper, 25 cents. Suggestions for parents to get their children to accept responsibility.

EVALUATING RESEARCH AND DEVELOPMENT: Annotated Proceedings of a Conference of Research Administrators Held on the Campus of the University of California, May 10, 1952—Irving R. Weschler and Paula Brown, Eds.—*Institute of Industrial Relations*, 104 p., paper, \$1.65. Explores the influence of certain human variables on productivity.

FREDDY FOX SQUIRREL—R. W. Eschmeyer—*Fisherman*, 49 p., illus., paper 50 cents, cloth \$1.50. For children, this emphasizes the principles of sound game management.

FROM LODESTONE TO GYRO-COMPASS—Capt. H. L. Hitchins and Comdr. W. E. May—*Philosophical Library*, 219 p., illus., \$4.75. A non-technical book on this navigation device.

GENERAL COLLEGE CHEMISTRY—Frank Brescia—*Blackiston*, 581 p., illus., \$6.00. For the first year college science and engineering student.

GROUP PSYCHOTHERAPY: Studies in Methodology of Research and Therapy—Florence B. Powdermaker and Jerome D. Frank—*Harvard*, 615 p., \$6.50. Report of a group psychotherapy research project of the U. S. Veterans Administration.

HORMONAL AND NEUROGENIC CARDIOVASCULAR DISORDERS: Endocrine and Neuro-Endocrine Factors in Pathogenesis and Treatment—Wilhelm Raab—*Williams & Wilkins*, 722 p., illus., \$15.00. Bridges the gap between the field of endocrinology and the field of clinical cardiology.

HOW TO PASS ANNAPOLIS & WEST POINT ENTRANCE EXAMS—Paul R. Copeland—*Arco*, 160 p., illus., \$3.50. A study and information guide for military-minded young men.

MINERALS: A Key To Soviet Power—Demitri B. Shimkin—*Harvard*, 452 p., \$8.00. A survey of the resources, production and consumption position of the U.S.S.R. and its potentialities.

NATIVE ASTRONOMY IN THE CENTRAL CAROLINES—Ward H. Goodenough—*University of Pennsylvania Press*, 46 p., illus., paper, 75 cents. Most of the star names and positions are common to the entire Caroline group.

OUT OF MY LIFE AND THOUGHT: With Postscript 1932-1949—Albert Schweitzer—*New American Library*, 216 p., paper, 35 cents. The autobiography of a great medical missionary.

PALEOZOIC AND MESOZOIC ARACHNIDA OF EUROPE—Alexander Petrunkevitch—*Geological Society of America*, Memoir 53, 128 p., illus., \$3.00.

PHYSICAL CHEMISTRY FOR COLLEGES: A Course of Instruction Based upon the Fundamental Laws of Chemistry—E. B. Millard—*McGraw-Hill*, 7th ed., 618 p., illus., \$6.00. Revised to include new material, illustrations and problems.

PHYSICAL CHEMISTRY OF METALS—Lawrence S. Darken and Robert W. Gurry—*McGraw-Hill*, 535 p., illus., \$8.50. A chemical thermodynamics text for the metallurgy student.

POTTERY: Getting Started in Ceramics—Delmar W. Olson—*Laurel Publishers (Grosset & Dunlap)*, 113 p., illus., \$4.95. Step-by-step procedure for the beginner.

PREHISTORIC BRITAIN—Jacquetta and Christopher Hawkes—*Harvard*, 280 p., illus., \$3.50. Life in Britain from the first traces of Paleolithic Man to the Roman Conquest of Claudius as revealed by archaeology.

PROBLEMS OF INFANCY AND CHILDHOOD—Milton J. E. Senn, Ed.—*Josiah Macy, Jr., Foundation*, 160 p., \$2.50. Papers given at the Sixth Conference, dealing with emotional development and individual tendencies in the first year of life, etc.

ROCKET AWAY!—Frances Frost—*Whittlesey*

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House, 48 p., illus., \$2.00. A space adventure to the moon for the 6- to 10-year-olds.

SPORTSMAN'S DIGEST OF FISHING—Hal Sharp—*Sterling*, 253 p., illus., \$1.50. Contains practical information for the fisherman.

THE STARS ARE YOURS—James S. Pickering—*Macmillan*, rev. ed., 298 p., illus., \$3.95. Explains astronomy, emphasizing the objects you can see without a telescope, and avoiding involved scientific terminology and higher mathematics.

A THIRD CENTURY HOARD OF TETRADRACHMS FROM GORDION—Dorothy H. Cox—*University of Pennsylvania Press*, 28 p., illus., paper, 75 cents. Excavations at Gordion in 1951 unearthed 114 silver coins which are indexed here.

THIRTEEN AMERICANS: Their Spiritual Autobiographies—Louis Finkelstein, Ed.—*Harper*, 296 p., \$3.00. Includes chapters on Edwin G. Conklin, Henry N. Russell and Basil O'Connor.

Science News Letter, April 4, 1953

FORESTRY

Scientist Hunts for Abnormal Pine Trees

► DR. BRUCE ZOBEL, geneticist with the Texas Forest Service, has sounded a call for pine trees with abnormal cone development.

Certain types of cone abnormalities can be used, he explains, as a source of controlled hybrid seed, now much in demand among foresters and geneticists, particularly those in southern states.

Pines most needed are those bearing large numbers of female cones on each branch, instead of the usual one to five cones. Of particular interest, also, are so-called male sterile pines which produce abundant female cones but on which no pollen-bearing cones are produced.

Most interesting of all types of pines for hybrid research would be those described above that produce the same abnormality each year, showing it to be genetic in nature, rather than merely an isolated physiological abnormality.

Science News Letter, April 4, 1953

INSECT NETS and ENTOMOLOGICAL EQUIPMENT

Everything needed for collecting, mounting and displaying butterflies and other insects is offered in the 48-page illustrated TURTOX NATURALISTS CATALOG. This helpful publication contains a special chapter on "Making an Insect Collection." Write for your free copy, addressing General Biological Supply House, Inc., 761 East 69th Place, Chicago 37, Illinois.

PHYSICS

Sun-Heated Houses

► SCIENTISTS ARE trying to capture the energy in sunlight and harness it to everyday living in America. But so far, big, black clouds seem to be darkening the sunny outlook for fuelless cars, furnaceless houses and coalless power plants.

From Ohio State University, Dr. J. Allen Hynek sounds the warning that it is "high time" science began learning how to use the sun as a source of industrial power. He points out that coal, oil and gas supplies will not last forever.

The fuel reserves will be lost "many millions of years before any very great change occurs in the sun's radiation," he said.

Dr. Hynek suggests that a tower-mounted black hemisphere could collect heat from the sun to supply modest amounts of power at a relatively small cost. Mirrors, spotted over several acres of land, would catch the sun rays and focus them on the black half-ball.

In open, semi-arid regions, heat captured by the hemisphere would be enough to boil water. The resulting steam presumably could be piped into a small electric generator or fed into home radiators.

R. S. Dill, chief of the heating and air conditioning section of the National Bureau of Standards, said solar heating of houses has been satisfactorily demonstrated as far north as Boston, but pointed out that solar

heating plants probably would be too expensive for widespread use.

The heating system might also detract from the looks of the house, as well as require that a room or part of the basement be made a heat reservoir in which heat could be stored in the day for use at night.

Solar-electric power stations probably could not produce power in quantity as cheaply as hydro-electric and steam plants produce it today.

Such solar-electric plants would have another disadvantage: they would supply the maximum amount of electric power about noon, whereas the peak power demand comes just after dark when electric stoves, house lights, store signs and television sets are switched on.

Commercial electric power is generated to be consumed instantly. It cannot be stored.

Science News Letter, April 4, 1953

TECHNOLOGY

"Brain" for Rent—\$11,900 Per Month

► "BRAIN" FOR rent—for \$11,900 or more per month, you can buy the computing time of the first production model of the "701" calculator just put into operation in New York.

It will not replace or substitute for the human brain, but it will perform routine computations to solve such problems as calculating the radiation effects in atomic energy, and the design of steam and gas turbines. First of 12 or more scheduled for production this year, the "701" was built by International Business Machines Corporation in Poughkeepsie, N. Y.

The "brain" can perform more than 16,000 addition or subtraction operations a second, and more than 2,000 multiplication or division operations a second.

Science News Letter, April 4, 1953

Questions

AERONAUTICS—Why do jet pilots need an instant warning of engine failure? p. 212.

• • •

DENTISTRY—What chemicals are responsible for tooth growth and eruption? p. 216.

• • •

MEDICINE—What are the clues to pre-leukemia? p. 214.

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METEOROLOGY—How will weather maps of future be made? p. 215.

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PHOTOGRAMMETRY—How is map making being revolutionized? p. 213.

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PSYCHIATRY—What is the present state of Soviet psychiatry? p. 212.

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PUBLIC SAFETY—How many accidents are caused each year by bathtubs? p. 213.

• • •

Photographs: Cover and p. 211, Fremont Davis; p. 213, North American Aviation, Inc.; p. 214, University of Wisconsin; p. 215, Goodyear Tire & Rubber Co.; p. 218, The Scientific Monthly; p. 224, Eastman Chemical Products, Inc.

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☛ **DISH DRAINER** features eight wire supports that hold glasses upside down outside the drainer, making more room inside for dishes. A removable plastic cup that fits inside the drainer holds silverware upright while it dries.

Science News Letter, April 4, 1953

☛ **PLASTIC WASTE** paper basket which can also be used as a liner for pedal-operated garbage cans is rustproof, flexible and non-breakable. Easy to clean, the liner is nine and a half inches in diameter and stands ten and a quarter inches high.

Science News Letter, April 4, 1953

☛ **LEAD-FREE ENAMEL** contains no toxic ingredient, the maker reports. This makes it especially good for crib and playpen surfaces that may be nibbled on by infants. Colored with real pigments, the enamel produces a tough coating that withstands hard wear and repeated scrubbing.

Science News Letter, April 4, 1953

☛ **STEAK KNIVES** for the dinner table have their blades set on an angle like knives that chefs use, as shown in the illustration. The blade angle and "natural grip" butyrate plastic handles are said to give superior



leverage on tough meat. Made of surgical steel, the blades will not come loose from the handles, the manufacturer reports.

Science News Letter, April 4, 1953

☛ **"WOODPAPER"** IS made of 10 African and European woods that have been

finely shaven and glued to thin paper backings. Available in rolls, the material makes novel coverings for books, albums, metal objects and boxes. It does not tear easily under tension and can be stamped, printed, bent, painted, lacquered, punched or polished.

Science News Letter, April 4, 1953

☛ **PORTABLE WINCH** has a capstan-type drum that permits the operator to control carefully the load being raised. The unit is available in gasoline- and electric-powered models of horsepowers varying from $\frac{3}{4}$ to $7\frac{1}{2}$. When in use, the winch can be held in place by $\frac{1}{2}$ -inch lag bolts.

Science News Letter, April 4, 1953

☛ **WINDOW-CLEANING SOLUTION**, packaged in an 11-ounce, push button spray-on can, is said to clean a greater area than conventional liquid window cleaners. The can dispenses the solution as a fine mist which the housewife wipes from windows and mirrors with a clean cloth.

Science News Letter, April 4, 1953

☛ **RESIN ADHESIVE** is said to be suitable for bonding non-porous surfaces such as those of metal, glass, natural or synthetic rubber, ceramics, woods, and layers of phenolic and glass fibers. The adhesive bonds the materials either to themselves or to each other. It resists boiling water, acids, alkalis and most organic solvents, and is recommended where shrinkage cannot be tolerated.

Science News Letter, April 4, 1953

Spring is here . . .

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TO GIVE YOU A HEAD START

★ **1953 SEEDS**—Royal Carpet Alyssum, 1953 All-America silver medal winner. Four vegetable seeds for the home garden: small-vined, early maturing tomato; spineless okra; giant radish; late-maturing, vitamin broccoli.

★ **1952 SEEDS**—Salad Bowl lettuce, long-lasting and heat-resisting garden lettuce, Mandarin Chinese cabbage and Celosia Pampas Plume, a new cockscomb—all available for the first time in 1952; Dianthus Double Gaiety, new member of the "pink" family . . . all are particularly suitable for home gardens.

★ **1951 SEEDS**—Recent flower breeding progress demonstrated by Glitters marigold, top-flight new marigold, and Limelight Marigold, best of its type a decade ago. Two cucumber varieties, one wilt-resistant, show progress in breeding new vegetables.

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Do You Know?

Oysters put on weight even when they show little or no shell growth.

The human eye can detect a decrease in light intensity in the ratio of one part in 100.

Spraying nitrogenous fertilizers directly on the leaves of orange trees has proved more economical than soil applications.

Turf grasses, commonly believed to be shallow-rooted, can grow deep roots under favorable soil and management conditions.

Chest expansions of up to nine inches have been developed over the centuries by Bolivian Indians to cope with the thin air of the Andes.

Jet pilots measure their aircraft fuels in pounds rather than in gallons because fuel density can change as much as 10% at high altitudes, shrinking the volume deceptively.